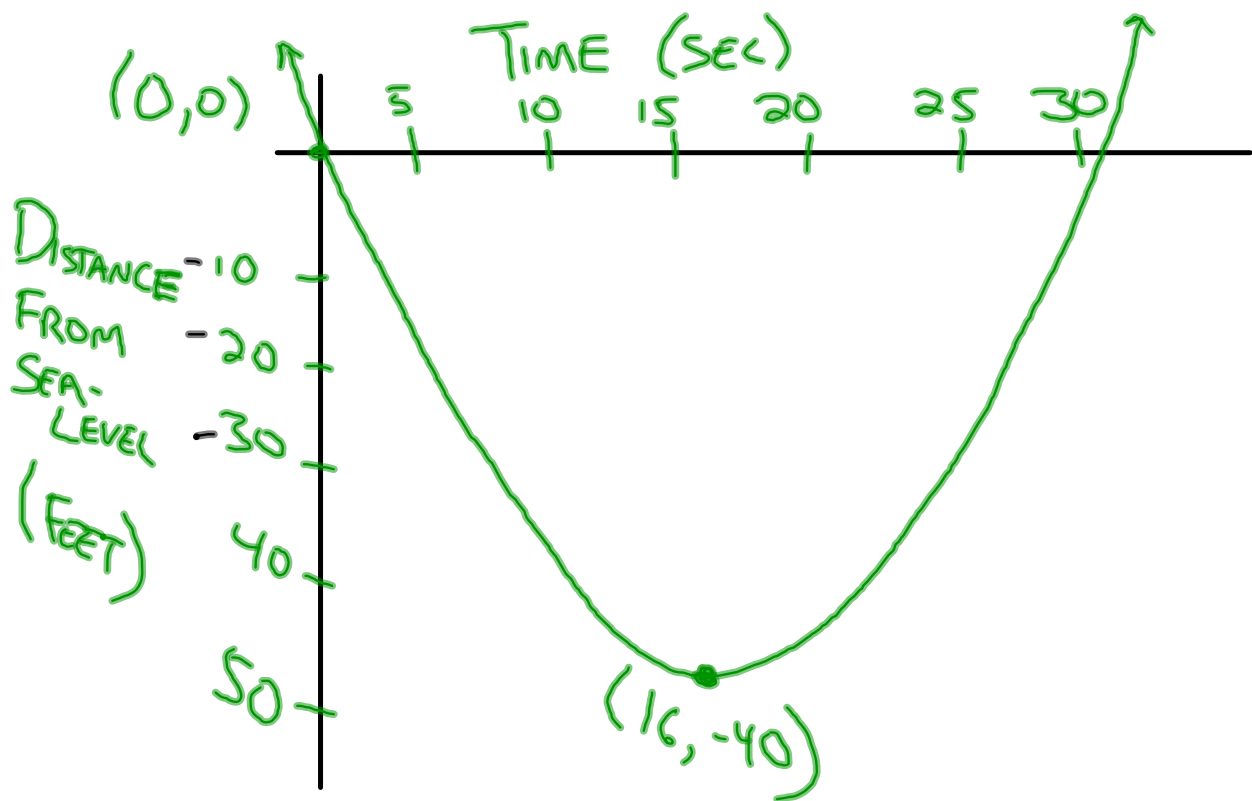


“Help Mr. Boggus do his job” Activity

Your job, should you choose to accept it, is to create a test question for Mr. Boggus. In order to do this, you need to create a quadratic equation that models a “real-life” scenario. Start by thinking of a situation that could be modeled by a quadratic function. Use this idea to create a story problem. In your story problem, make sure to include your function. Then follow the steps below:

- a) Write a story problem
- b) Draw a graph with a scaled x&y axis that represents your story.
- c) Create a question whose answer is the y-intercept of your graph.
- d) Create a question whose answer is the vertex of your graph.
- e) Create a question whose answer is the x-intercept of your graph.
- f) Create a question whose answer is a point on the graph.
- g) Find the function of the graph that relates to your story problem.
- h) Create an answer key for your quiz problem.

One day, Aquaman was walking along the beach. A young lady was in tears because she had lost her wedding ring (it had fallen off while she was swimming in the ocean) He decided he wouldn't be much of a super hero if he didn't help her, so he jumped into the water and dove towards a shiny spot at the bottom of the ocean. After he grabbed the ring, he swam back to the top and returned the item of value to the distraught young lady and everything was peachy...



How to find the equation of your line:

YOU NEED TO FIND THE VALUE OF "a"

VERTEX (16, -40)
POINT (y-INT) (0, 0)

$$y = a(x - h)^2 + k$$

$$0 = a(0 - 16)^2 - 40$$

$$0 = a(16)^2 - 40$$

$$0 = 256a - 40$$

$$40 = 256a$$

Now use your
VERTEX + a

$$y = a(x - h)^2 + k$$

$$.15625 = a$$

$$a = .15625$$

VERTEX (16, -40)
h k

$$y = .15625(x - 16)^2 - 40$$

Now CONVERT TO STANDARD FORM

$$y = .15625(x - 16)^2 - 40$$

$$y = .15625(x - 16)(x - 16) - 40$$

$$y = .15625(x^2 - 16x - 16x + 256) - 40$$

$$y = .15625(x^2 - 32x + 256) - 40$$

$$y = .15625x^2 - 5x + 40 - 40$$

$$y = .15625x^2 - 5x$$

Test.

One day, Aquaman was walking along the beach. A young lady was in tears because she had lost her wedding ring (it had fallen off while she was swimming in the ocean) He decided he wouldn't be much of a super hero if he didn't help her, so he jumped into the water and dove towards a shiny spot at the bottom of the ocean. After he grabbed the ring, he swam back to the top and returned the item of value to the distraught young lady and everything was peachy...

The scenario can be modeled by the equation $y = .15625x^2 - 5x$

- 1) How deep did Aquaman dive and how long did it take for him to reach the bottom of the ocean?
- 2) How long was Aquaman under the water?
- 3) What was Aquaman's distance from sea level after 22 seconds?

Answer Key.

$$Y = .15625x^2 - 5x$$

- 1) How deep did Aquaman dive and how long did it take for him to reach the bottom of the ocean?

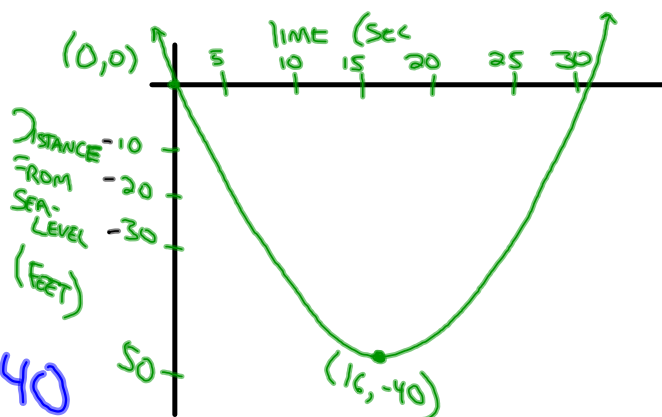
VERTEX

$$X = \frac{-b}{2a} = \frac{+5}{2(.15625)} = 16$$

$$X = 16 \text{ SECONDS}$$

$$Y = .15625(16)^2 - 5(16) = -40$$

$$Y = -40 \text{ FT BELOW}$$



- 2) How long was Aquaman under the water?

X-INT.

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{5 \pm \sqrt{5^2 - 4(.15625)(0)}}{2(.15625)}$$

$$X = \frac{5 \pm \sqrt{25}}{.3125} = \frac{5 \pm 5}{.3125}$$

$$X = 0, 32$$

$$X = 32 \text{ SECONDS}$$

- 3) What was Aquaman's distance from sea level after 22 seconds?

FIND $f(22)$ OR $X = 22$

$$Y = .15625(22)^2 - 5(22)$$

$$Y = -34.375 \text{ FT BELOW}$$

1) How deep did Aquaman dive and how long did it take for him to reach the bottom of the ocean?

Y-INTERCEPT

2) How long was Aquaman under the water?

VERTEX

3) What was Aquaman's distance from sea level after 22 seconds?

X-INTERCEPT
POINT ON THE GRAPH